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06/30/2009

URGENT

For Examiner Joseph Kosack

FAX 571-273-5575

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

BONRATH et al.

Appln. No. 10/571,261

Filed: April 13, 2006

Confirmation No. 6120

Atty. Ref.: 4662-162

T.C. / Art Unit: 1626

Examiner: J.R. Kosack

FOR: A NEW ROUTE TO α -TOCOPHERYL ALKANOATES AND PRECURSORS
THEROF**INTERVIEW SUMMARY**

June 30, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Examiner Kosack:

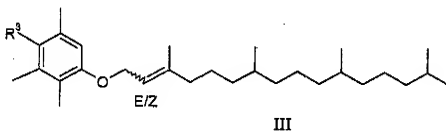
Applicants thank the Examiner for the interview. The pending claims were discussed. Applicants are enclosing a proposed amendment to the claims and a set of claims with the amendments entered as requested by the Examiner for his consideration. If any fee is required for an Examiner's Amendment, Applicants authorize the fee (or any deficiency therein) to be charged to Deposit Account 14-1140 under Order No. 4662-162.

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PROPOSED AMENDED CLAIMS FOR AN EXAMINER'S AMENDMENT

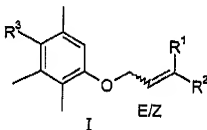
1. (Previously Presented) A process for the manufacture of compounds represented by the following formula III



wherein R3 is C2-5-alkanoyloxy,

by the reaction of

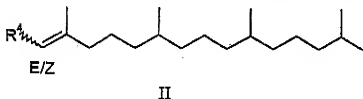
a) a compound represented by the following formula I



wherein R1 and R2 are independently from each other H or C1-5-alkyl, with the proviso that at least one of R1 and R2 is not H, and

wherein R3 is as defined above, with

b) a compound represented by the following formula II



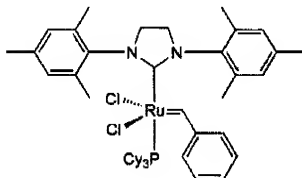
wherein R4 is H or CH2-R5,

wherein R5 is formyloxy, C2-5-alkanoyloxy, benzoyloxy, C1-5-alkoxy or OSiR6R7R8,

wherein R6, R7 and R8 are independently from each other C1-6-alkyl or phenyl,

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in the presence of a cross-metathesis catalyst, wherein the cross-metathesis catalyst is



wherein Cy is cyclohexyl.

2-5. Canceled.

6. (Previously Presented) The process as claimed in claim 1, wherein the reaction is carried out in an aprotic organic solvent.

7. (Original) The process as claimed in claim 6, wherein the aprotic organic solvent is a dialkyl ether R18-O-R19, tetrahydrofuran, tetrahydropyran, 1,4-dioxane, methylene chloride, chloroform, cumene, an optionally once, twice or thrice methylated arylene, or a mixture thereof,

wherein R18 and R19 are independently from each other linear C1-4-alkyl or branched C3-8-alkyl.

8. (Currently Amended) The process as claimed in claim 7, wherein the aprotic organic solvent is tetrahydrofuran, methylene chloride, chloroform, toluene or a mixture thereof, preferably toluene.

9. (Currently Amended) The process as claimed in claim 6, wherein from about 3 ml to about 15 ml, preferably from about 4 ml to about 10 ml, more preferably from about 4.5

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~~ml to about 8 ml~~ of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.

10. (Previously Presented) The process as claimed in claim 1, wherein the reaction is carried out essentially in the absence of an additional solvent.

11. (Currently Amended) The process as claimed in claim 10, wherein the reaction is carried out in vacuo, ~~preferably at a pressure below 100 mbar.~~

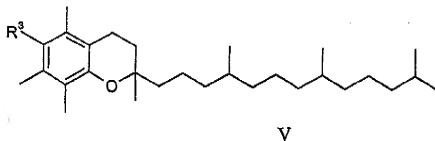
12. (Currently Amended) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 0.0001 mol% to about 20 mol%, ~~preferably from about 1.0 mol% to about 10 mol%, more preferably from about 2 to about 5 mol%.~~

13. (Currently Amended) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:10 to about 10:1, ~~preferably from about 1:5 to about 5:1, more preferably from about 1:3 to about 4:2.5.~~

14. (Currently Amended) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 10°C to about 120°C, ~~preferably from about 30°C to about 100°C, especially from about 40°C to about 85°C.~~

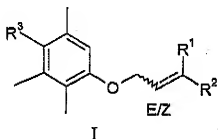
15. (Previously Presented) A process for the manufacture of α -tocopheryl alkanoates represented by the following formula V

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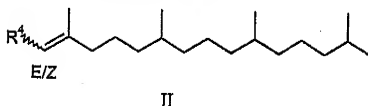


comprising the following steps:

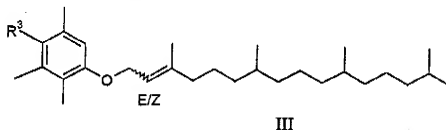
i) reacting of a compound represented by the following formula I



with a compound represented by the following formula II



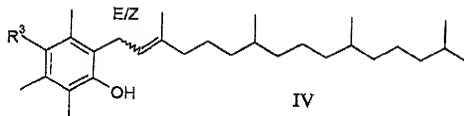
to a compound represented by the following formula III



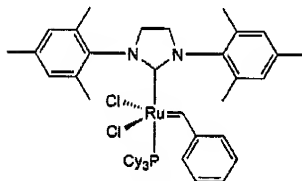
in the presence of a cross-metathesis catalyst,

ii) subjecting the compound represented by the formula III and obtained in step i) to a rearrangement to the compound represented by the following formula IV, and

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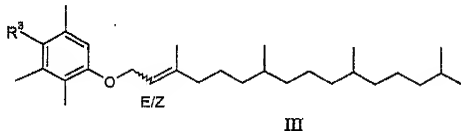


iii) subjecting the compound represented by the formula IV and obtained in step ii) to a cyclization to the compound represented by the formula V, wherein R1, R2, R3 and R4 are as defined in claim 1, wherein the cross-metathesis catalyst is



and wherein Cy is cyclohexyl.

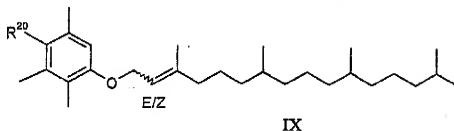
16. (Original) Compounds of the formula III



wherein R3 is C2-5-alkanoyloxy.

17. (Original) Compounds of the formula IX

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wherein R20 is C3-5-alkanoyloxy.

18-19. Canceled.

20. (New) The process as claimed in claim 7, wherein the aprotic organic solvent is toluene.

21. (New) The process as claimed in claim 6, wherein from about 4 ml to about 10 ml of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.

22. (New) The process as claimed in claim 6, wherein from about 4.5 ml to about 8 ml of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.

23. (New) The process as claimed in claim 10, wherein the reaction is carried out at a pressure below 100 mbar.

24. (New) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 1.0 mol% to about 10 mol%.

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25. (New) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 2 to about 5 mol%.

26. (New) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:5 to about 5:1.

27. (New) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:3 to about 1:2.5.

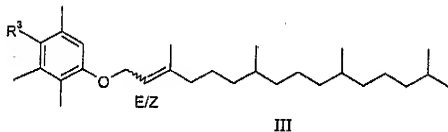
28. (New) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 30°C to about 100°C.

29. (New) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 40°C to about 85°C.

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CLAIMS IF THE PROPOSED EXAMINER'S AMENDMENT WERE ENTERED

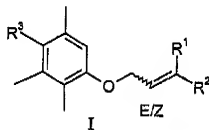
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wherein R3 is C2-5-alkanoyloxy,

by the reaction of

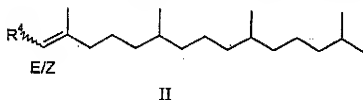
a) a compound represented by the following formula I



wherein R¹ and R² are independently from each other H or C1-5-alkyl, with the proviso that at least one of R¹ and R² is not H, and

wherein R3 is as defined above, with

b) a compound represented by the following formula II



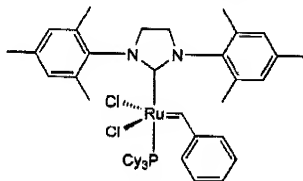
wherein R4 is H or CH2-R5,

wherein R5 is formyloxy, C2-5-alkanoyloxy, benzoyloxy, C1-5-alkoxy or OSiR6R7R8,

wherein R6, R7 and R8 are independently from each other C1-6-alkyl or phenyl,

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in the presence of a cross-metathesis catalyst, wherein the cross-metathesis catalyst is



wherein Cy is cyclohexyl.

2-5. Canceled.

6. (Previously Presented) The process as claimed in claim 1, wherein the reaction is carried out in an aprotic organic solvent.

7. (Original) The process as claimed in claim 6, wherein the aprotic organic solvent is a dialkyl ether R18-O-R19, tetrahydrofuran, tetrahydropyran, 1,4-dioxane, methylene chloride, chloroform, cumene, an optionally once, twice or thrice methylated arylene, or a mixture thereof,

wherein R18 and R19 are independently from each other linear C1-4-alkyl or branched C3-8-alkyl.

8. (Previously Presented) The process as claimed in claim 7, wherein the aprotic organic solvent is tetrahydrofuran, methylene chloride, chloroform, toluene or a mixture thereof.

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9. (Previously Presented) The process as claimed in claim 6, wherein from about 3 ml to about 15 ml of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.

10. (Previously Presented) The process as claimed in claim 1, wherein the reaction is carried out essentially in the absence of an additional solvent.

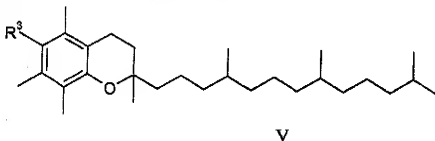
11. (Previously Presented) The process as claimed in claim 10, wherein the reaction is carried out in vacuo.

12. (Previously Presented) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 0.0001 mol% to about 20 mol%.

13. (Previously Presented) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:10 to about 10:1.

14. (Previously Presented) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 10°C to about 120°C.

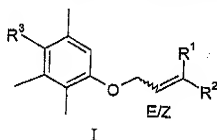
15. (Previously Presented) A process for the manufacture of α -tocopheryl alkanoates represented by the following formula V



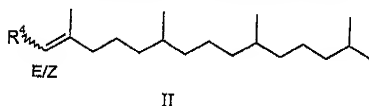
comprising the following steps:

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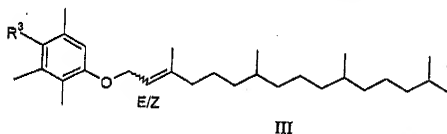
i) reacting of a compound represented by the following formula I



with a compound represented by the following formula II

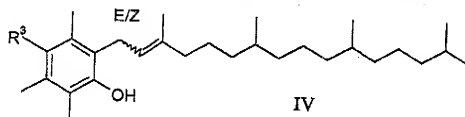


to a compound represented by the following formula III



in the presence of a cross-metathesis catalyst,

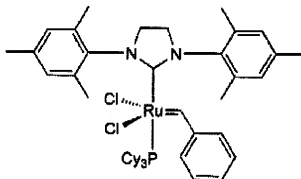
ii) subjecting the compound represented by the formula III and obtained in step i) to a rearrangement to the compound represented by the following formula IV, and



iii) subjecting the compound represented by the formula IV and obtained in step ii) to a cyclization to the compound represented by the formula V,

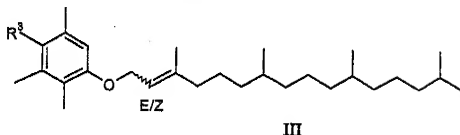
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wherein R1, R2, R3 and R4 are as defined in claim 1 ,
wherein the cross-metathesis catalyst is



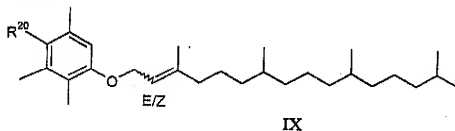
and wherein Cy is cyclohexyl.

16. (Original) Compounds of the formula III



wherein R3 is C2-5-alkanoyloxy.

17. (Original) Compounds of the formula IX



wherein R20 is C3-5-alkanoyloxy.

18-19. Canceled.

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20. (Previously Presented) The process as claimed in claim 7, wherein the aprotic organic solvent is toluene.
21. (Previously Presented) The process as claimed in claim 6, wherein from about 4 ml to about 10 ml of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.
22. (Previously Presented) The process as claimed in claim 6, wherein from about 4.5 ml to about 8 ml of the aprotic organic solvent are used per mmol of compound a) or b), whichever is used in the lesser amount.
23. (Previously Presented) The process as claimed in claim 10, wherein the reaction is carried out at a pressure below 100 mbar.
24. (Previously Presented) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 1.0 mol% to about 10 mol%.
25. (Previously Presented) The process as claimed in claim 1, wherein the relative amount of the cross-metathesis catalyst to the amount of compound a) or b), whichever is used in the lesser amount, is from about 2 to about 5 mol%.
26. (Previously Presented) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:5 to about 5:1.
27. (Previously Presented) The process according to claim 1, wherein the molar ratio of compound a) to compound b) present in the reaction mixture is from about 1:3 to about 1:2.5.

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28. (Previously Presented) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 30°C to about 100°C.

29. (Previously Presented) The process as claimed in claim 1 wherein the reaction is carried out at temperatures from about 40°C to about 85°C.

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Conclusion

Applicants thank the Examiner for the courtesy of an interview and respectfully request the allowance of the claims after an Examiner's Amendment. The Examiner is invited to contact the undersigned if additional information is required.

Respectfully submitted,

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